

Research Article

Play preference of children with ADHD and typically developing children in Brazil: A pilot study

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Background/aim: Children with attention deficit hyperactivity disorder (ADHD) have been reported to have play deficits, which can cause problems in occupational development. The aim of this paper was to report research findings on children with ADHD and typically developing children in relation to preference of play partners, play places, toys and type of play.

Methods: Thirty-two school aged children from low socioeconomic status were divided into two groups. One group of 16 children with ADHD were matched with 16 typically developing children.

Results and conclusion: There were no significant differences between the two groups in relation to play partners, with classmates being the most frequent play partner for both groups. There were significant differences between the two groups in preferred place to play. Children with ADHD preferred to play in school and typically developing children preferred to play on the street. There were significant differences in relation to toys and type of play engaged in with children with ADHD preferring educational materials and typically developing children prefer-

ring electronic games. These findings add to knowledge of Brazilian children with ADHD and their play preferences. Comparisons are made with research with Australian children with and without ADHD.

KEY WORDS children, ADHD, play, plaything.

Introduction

Attention deficit hyperactivity disorder (ADHD) is a health problem with associated difficulties in academic performance, and psychological and social problems (Brook & Geva, 2001; Mattos *et al.*, 2006; Poeta & Rosa-Neto, 2004). The prevalence of ADHD is estimated to be between three and five per cent of school-aged children, depending on the criteria used (Pastura, Mattos, & Araújo, 2007). In Brazil, using the Diagnostic and Statistical Manual of Mental Disorder (DSM-IV), the prevalence rate ranges 5.8–17.1% (Rohde *et al.*, 1999; Vasconcelos *et al.*, 2003), with males represented proportionally higher than females with a ratio of 3:1 to 5:1 respectively (Kaplan, Sadock & Grebb, 2003).

ADHD is characterised by difficulty in maintaining attention and concentration, hyperactivity and impulsivity (Graeff & Vaz, 2006). These may compromise the performance of children, and hinder their engagement in play activities (Fischer, Burd, Kuna & Berg, 1985). Through play, children actively construct their experience of the world, make decisions and solve problems, and develop autonomy, creativity and self-regulation (Stagnitti, 2009). Through play children have opportunities for physical contact, social interactions and communication with their peers, to learn, to construct ideas, to understand their many roles in society (Uren & Stagnitti, 2009) to acquire confidence in their own potential and use their imagination (Ostrosky & Meadan, 2010).

Leipold and Bundy (2000) observed that children with ADHD play less than their typically developing

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peers. Children with ADHD present some difficulties in identifying the emotional state of their play partners, and as a result they do not demonstrate empathy and reciprocal sharing, and this sometimes leads to play being interrupted (Cordier, Bundy, Hocking & Einfeld, 2009). Although their behaviour does not impact on the time they spend with friends, children with ADHD present with less intensive interactions with their peers as they have difficulties in social relationships with their peers and are not aware of the solicitations from their play partners (Cordier *et al.*, 2009). Children with ADHD are reprehended many times because of their behaviour (which is interpreted as misbehaviour) and this results in a sense of low self-esteem which can have the consequence of reducing pleasure in physical activities that involve interaction with partners (Harvey *et al.*, 2009). This inability to control their play actions is a result of the child's hyperactivity and impulsivity (Cordier *et al.*, 2009). Difficulties in playing with peers has implications for the child's occupational development and understanding how children with ADHD socially interact and play with their peers can contribute to the design of intervention strategies.

Play is an important activity which contributes to and promotes the development of intellectual, social, emotional and physical abilities of children (Alves & Gnoato, 2003; Campos & Francischini, 2003; Poletto, 2005). It is the natural context children use to interact with their world, because it offers opportunities for pleasure, discovery, mystery, creativity and self-expression (Ferland, 1997). Through play children develop their self-knowledge, exercise their potential and integrate their emotional understanding of events by recreating situations where they experienced excitement, happiness, anxiety, fear or anger (Pedro *et al.*, 2007).

Play is influenced by the cultural context in which it occurs (Gosso, 2004; Vectore, 2003), and these contexts can result in differences in the choice of play activities of children from various cultures (Meira, 2003). Brazil and Australia are countries with large metropolitan cities to small rural towns and these provide different cultural and social contexts which influence children's play. In Australia, some studies have analysed the play of children from different geographical locations, socioeconomic status and cultural background (Downes, 2002; Veitch, Bagley, Ball & Salmon, 2006; Dender & Stagnitti, 2011). Dender & Stagnitti reported play material preferences for Australian indigenous children and found that Australian Indigenous children preferred dark coloured dolls and native toy animals to play with. Veitch *et al.* studied Australian children from different socio-economic areas in Melbourne and reported on where they played and why they played there. In Brazil, Gosso, Moraes and Otta (2007) reported on research studies that had been carried out on the play of children from different cultural groups, including children who lived in the Amazon to children who lived in large metropolitan

cities. Pfeifer (2006) found that for Brazilian children, their choices of partners and play places were influenced by gender, generation and socioeconomic status. Researchers from both countries have found differences in children's play influenced by socioeconomic status, city (rural, urban and metropolitan), gender and indigenous or non-indigenous children.

The present study was carried out in Brazil and aimed to investigate the difference between the play of children with ADHD and typically developing children in relation to play partners, play places and toys used in play.

We tested the following three hypotheses:

Hypothesis 1: The mean children's play behaviour scores for items related to 'playmate preference' will be significantly different for children with ADHD compared to typically developing playmates.

Hypothesis 2: The mean children's play behaviour scores for items related to 'preferred places to play' will be significantly different for children with ADHD compared to typically developing playmates.

Hypothesis 3: The mean children's play behaviour scores for items related to 'preferred toy and play activities' will be significantly different for children with ADHD compared to typically developing playmates.

Methods

Participants

The sample was composed of 32 school-aged children (7–12 years) from families of low socioeconomic status as defined by the classification of the Critério de Classificação Econômica Brasil (ABEP - Associação Brasileira de Empresas de Pesquisa., 2008). This classification is based on family income, highest education level of the household head and other factors. The classification has seven levels (A1, A2, B1, B2, C, D and E). The children in this study came from families classified as level C and D, where the family income is low. All participants attended a public primary school.

The clinical group (G1) was composed of 16 children (14 boys and two girls) with a diagnosis of ADHD. The ADHD diagnosis was given by a specialist team comprised of a paediatric neurologist, paediatric psychiatrist and psychologist, who worked in the neurological service at the university hospital. The DSM-IV was used by the team to determine a diagnosis of ADHD for a child. The children were diagnosed as ADHD Combined subtype (hyperactivity, impulsivity and inattention). The comparison group (G2) was composed of 16 typically developing children. The groups were matched by gender, age, educational level and socioeconomic status. In the group of children with ADHD, 50% of the children came from SES level C and 50% of the children came from SES level D. For the typically developing group, 56.3% came from SES level C and

TABLE 1: Demographic data for the sample

Gender	ADHD		Typical development	
	Birth year	Year at school	Birth year	Year at school
M	2001	1	2001	1
M	2000	1	2001	1
M	2000	2	2001	1
M	1999	2	1999	2
M	1999	1	1999	2
M	1999	3	1999	3
M	1999	3	1999	3
M	1998	3	1998	4
M	1998	4	1998	4
M	1998	4	1998	4
M	1998	4	1998	4
M	1998	1	1998	4
M	1998	3	1998	4
M	1998	4	1998	4
F	1998	2	1998	4
M	1997	4	1997	4
F	1996	4	1996	4

ADHD, attention deficit hyperactivity disorder;
M, male; F, female.

43.7% came from level D. All children were from a city with 600,000 inhabitants in the State of São Paulo, which is in the south-east region of Brazil. Table 1 presents the demographic data for the sample.

Setting

Children in G1 (that is, the children with a diagnosis of ADHD) were assessed in a private room in the ambulatory neurology infant's section of the university hospital in a city in the state of Sao Paulo (Brazil). This room was very familiar to the children because they visited the university hospital at least once a month. The typically developing children (G2 group) were assessed in a private room at a primary school in the same city. The rooms were quiet and free from distraction. None of the children knew the researcher before the study, so to put the children at ease and to build rapport, the researcher chatted informally with the children before the assessment about what they liked to do, their family and their favourite television programmes.

Instruments

The children's play was assessed using the Children's Play Behaviour questionnaire (Pfeifer, 2006), which consists of 19 questions and takes 25 minutes to administer. This questionnaire is designed to be self-administered or for the questions to be asked by another person if the participant does not have the required level of literacy.

The first eight questions are open and are aimed to identify characteristics of the participant. The next 10 questions are multiple choice questions and are related to the play/leisure/sociocultural activities that the child engages in. The child is then instructed to rank all their chosen activities, partners and places of play in order of preference. Activities are also classified in order of frequency of engagement in the activity. The last question asks the child to describe his/her weekly routine.

This instrument has been used in several studies. In the development of the instrument, Pfeifer (2007) assessed 195 participants in a study that compared the play of boys and girls and compared the play of three different generations (born in the 1990s, the 1960s and the 1940s). Barichelo and Pfeifer (2006) used the Children's Play Behaviour questionnaire with 30 mothers who had children diagnosed with ADHD to investigate their view of their child's play. Mattos, Masalskas, Panuncio-Pinto and Pfeifer (2010) assessed 30 children and compared differences in the play of boys and girls. In these studies (that is, Barichelo & Pfeifer, 2006; Pfeifer, 2007; Mattos *et al.*, 2010) inter-rater reliability ranged from $\kappa = 0.91$ to 0.95 which is excellent reliability (Portney & Watkins, 1993). Test-retest reliability is still to be investigated. Discriminate validity has been established with significant differences found between boys and girls ($P = 0.000$) (in Pfeifer, 2007 and Mattos *et al.*, 2010) and between generations ($P = 0.000$) (Pfeifer, 2007).

Beutner and Pfeifer (2008) using the Ludic Play Assessment (Ferland, 1997) with mothers of preterm children noted that although the majority of mothers recognised the importance of play, they frequently did not observe how their children played and their responses were often socially desirable because they interpreted the questions as concerning the wellbeing of their children. To avoid these limitations the current study sought information about play (partners, places and toys) directly from the children with ADHD. Accessing information directly from the participant is more reliable than asking a third party (Cervo & Bervian, 2002). Self-report measures have been used in previous studies of children with ADHD and found to be reliable and valid (Owens, Maxim, Nobile, McGuinn & Msall, 2000; Hoza *et al.*, 2004; Harvey *et al.*, 2009).

In the present study, three multiple choice questions from the Children's Play Behaviour questionnaire were the focus of analysis. These were: *who the child plays with* (siblings, neighbours, classmates,¹ boys and girls, only children of the same gender,² only with father, only with mother, with both parents), *where the child plays* (club,

¹If the classmate was a neighbour, the children were invited to choose if they played in school or in the neighbourhood.

²Boys play only with other boys and girls play only with other girls.

square, school, neighbour's house, street, yard, inside the home), and *what the child plays* (dolls, games (dominoes, memory), miniature cars, construction (Lego®), balls, video games, pretend play, computer games, dress-ups,³ making sand castles, run and catch,⁴ hide and seek,⁵ 'who's got the ring',⁶ hop-scotch, elastic, draw, paint, dolls' house, toy school,⁷ skate, stand skate, flying kites, bowling, marbles). For each question, the children indicated how many of the activities, play partners and places they played in and then they ranked the selection of their choices in order of preference.

Procedure for data collection

Ethics approval was received from the University Hospital and from the school where the research was carried out. All ethical procedures were adhered to.

Parents were contacted and given information about the research. Only those children with parental consent were included in the study. After consent was received, information was gathered on socioeconomic status using the Critério de Classificação Econômica Brasil. The children with parental consent were invited to participate in the research and answer questions from the Children's Play Behaviour questionnaire (Pfeifer, 2006).

The second author read the questions to the children and recorded their answers. This process ensured a standardised approach across both the groups and allowed

for a range of ages, literacy levels and writing levels. The standardised approach had two stages for each question. First, the researcher read the question and all the alternatives to the question and recorded the choice/s of the children. Then, the researcher read the alternatives that had been chosen by the children and asked them to prioritise their answers, starting with what, who or where they played the most.

Data analysis

The data were analysed according to: (i) play partners, (ii) place of play and (iii) toys and play activities. The children's highest priority for play activities/partners/places was classified as 'most preferred'. The other alternatives that they chose were classified as 'preferred' and the alternatives that the children did not choose were classified as 'least preferred'. After this classification, statistical analyses were made to determine whether there were significant differences between groups (G1 and G2). Non-parametric tests were used as the data were categorical and ordinal. The Fisher exact test was used to analyse for significant difference between the groups as the minimum expected frequencies were not expected to meet the requirements for a chi-square (Daniel, 1999). The unit of analysis was play preference and not individual items (Siegel & Castellan, 2006). As several Fisher Exact tests were carried out on the data, the hypothesis was rejected based on the value of b for each test. This value was identified by the arrangement of the data in the 2×2 contingency table where $A > B$ and the characteristic of interest is $a/A > b/B$ (Daniel, 1999). When the data are arranged the b value is identified as the smallest value of the characteristic in the group with the lowest values (Daniel, 1999). Alpha was set at .05 as .05 is recommended as the balance between Type I and Type II errors (Portney & Watkins, 1993), however, this varied depending on the value of b (Daniel, 1999).

Results

In both groups, 87.5% of the children were males. The age of the participants ranged between 7 and 12 years with a median age of 10 years for both groups. Group 1 (G1) had a mean age of 9.5 years with a standard deviation of 1.14 and Group 2 (G2) had a mean age of 9.38 with standard deviation of 1.33.

Play partner preference

There were no significant differences between groups in relation to preference (most preferred, preferred and least preferred) for play partners. Siblings were the most preferred play partners for both groups and there was no significant difference between the groups, with 37.5% from G1 and 43.8% from G2. Both groups preferred classmates as play partners, with 68.85% from G1 and 93.8% from G2. Less frequently preferred play partners were the child's father (87.5% from G1) and the child's mother

³The child uses a fancy dress and engages in role play.

⁴Similar to 'chasey'. The children choose one child (the catcher) who is going to catch the other children. The other children run away. When the child catches someone, the caught child becomes the catcher.

⁵The children choose one child (the seeker) who closes his/her eyes while the other children hide. This child holds his/her head against a wall and counts to 10 (or more if the place where they are playing is very large). When the child finishes counting he/she looks for the hidden children and when she/he finds one child both children run to the wall and hit it. If the seeker arrives first he/she says the name of the child who was found plus 'one, two, three' but if the other child arrives first he/she says his/her name plus 'save', and the seeker then continues looking for all the children until they are all found.

⁶One child has one ring and holds it hidden in his/her hands. The other children stand in front of him/her with their hands held slightly together similar to praying but with their fingers pointed away from their bodies, not pointing upwards. The child that is hiding the ring starts to put his/her hand between the hands of the other children and pretends that he/she is leaving the ring with them, but only one child receives the ring. When the holder of the ring has passed by all children he/she asks 'who's got the ring?'. The child who answers correctly passes the ring the next time.

⁷The children play 'school' with a black board, paper and lessons, with a child who is the teacher and the others are the students. Alternatively, one child is the teacher and the students are some dolls.

and father (87.5% from G2). Hypothesis 1 was not supported.

Table 2 presents the descriptive statistics and *P* value for each item.

Play place preference

There were significant differences between the groups in choice of places to play in relation to clubs, school, inside the home and outside in the yard (see Table 3). All the participants from both groups indicated preference (most preferred and preferred) to play at school but the children with ADHD stated that the school was the place where they most preferred to play (56.3%). For children from G2, the street was the most preferred place to play (37.5%). Hypothesis 2 was supported.

Less preferred places used for play were the club (75% of participants from G1) and the neighbour's house (50%

of participants from G2). The descriptive statistics for each item and the respective *P* values are in Table 3.

Toy and play activity preferences

In relation to toys and play activities, six subcategories were created to account for all activities chosen by the children. The subcategories were:

1. Motor activities were defined here as involving fine and/or gross motor coordination, spatial, body, and time awareness. This subcategory includes play with balls, run and catch, hide and seek, who's got the ring, hop-scotch, elastics, skate, stand skate, flying kites, marbles and bowling.

2. Symbolic play was defined as being playful activities that use the imagination and this category included: play with dolls, little cars, pretend play, dress ups, doll's house and toy school.

TABLE 2: Descriptive statistics for play partner preference

	ADHD (<i>n</i> = 16)			Typical development (<i>n</i> = 16)			Fisher's exact test significance (<i>P</i>)
	Most preferred	Preferred	Least preferred	Most preferred	Preferred	Least preferred	
Siblings	6	2	8	7	5	4	0.29
Neighbours	1	11	4	5	6	5	0.13
Child of same gender	0	7	9	0	4	12	0.46
Only with mother	1	4	11	0	2	14	0.39
Classmates	5	11	0	1	15	0	0.17
Boys and girls	0	9	7	0	12	4	0.46
Parents	1	5	10	1	5	10	1.0
Only with father	1	1	14	0	2	14	1.0

ADHD, attention deficit hyperactivity disorder.

TABLE 3: Descriptive statistics for places to play preferences

	ADHD (<i>n</i> = 16)			Typical development (<i>n</i> = 16)			Fisher's exact test significance (<i>P</i>)
	Most preferred	Preferred	Least preferred	Most preferred	Preferred	Least preferred	
Club	0	4	12	3	10	3	0.003**
Square	0	9	7	2	8	6	0.56
School	9	7	0	2	14	0	0.02*
Neighbours house	1	11	4	1	7	8	0.36
Street	1	7	8	6	6	4	0.12
Yard	0	16	0	2	9	5	0.007**
Inside of house	5	11	0	0	14	2	0.02*

ADHD, attention deficit hyperactivity disorder.

P* < 0.05; *P* < 0.01.

TABLE 4: Descriptive statistics toys and play activities preference

	ADHD (<i>n</i> = 16)†			Typical development (<i>n</i> = 16)†			Fisher's exact test significance (<i>P</i>)
	Most preferred	Preferred	Least preferred	Most preferred	Preferred	Least preferred	
Motor activities	5	84	87	2	120	54	0.000***
Symbolic Play	5	20	71	4	37	55	0.03*
Games with rules or construction	0	15	33	7	19	22	0.006**
Educational activities	2	27	3	0	27	5	0.48
Electronic games	4	21	7	3	25	4	0.62

ADHD, attention deficit hyperactivity disorder.

†There were 16 children in each group. For toy and play activity preference children were given several choices in each category to identify what they preferred to play. As children chose multiple activities in each category, the frequencies are more than 16.

P* < 0.05; *P* < 0.01; ****P* < 0.001.

3. Board games or construction were defined here as activities that involved rules and group play. This subcategory included making sand castles, games (dominoes, memory) and construction (e.g. Lego®).

4. Educational activities were defined here as being activities that involved the use of pencils, pens and brushes. This subcategory includes drawing and painting.

5. Electronic games were defined as activities that included using television to play computer games and this subcategory also included video games and computer games.

There were significant differences between the groups in relation to motor activities, symbolic play and board games or construction (see Table 4). Hypothesis 3 was partially supported. In G1, 90.6% of participants indicated that they played with educational activities, and 78.1% played with electronic games. For participants from G2, these preferences were reversed, with 87.5% reporting play with electronic games and 84.3% preferring educational activities. Although both groups reported the same preference for playing electronic games (81.3%), 75.0% from G1 and 93.8% from G2 preferred playing computer games (*P* = 0.36).

For G1, 31% of the participants reported their most preferred play activities were motor activities and symbolic play. For G2, 43.8% of the participants reported their most preferred play activity was playing board games or construction.

Although the motor activities were reported more frequently by children with ADHD, 43.2% of the G1 group reported motor activities as their least preferred activity. Of the motor activities, the most preferred motor activity for G1 was hide and seek (12.5%) with preferred motor activities being ball play (6.3%), run and catch (6.3%) and who's got the ring (6.3%). The participants from G2 also reported run and catch and hide and seek with 6.3%

reported for each play activity. There were no significant differences between the groups for these activities.⁸

Symbolic play was the least preferred play activity reported among participants from G2, with 39% of participants from this group saying they did not engage in this play activity. In symbolic play, playing with miniature cars was reported by 25% of the participants from G1 and 25% of the participants from G2. Even though the typically developing children's least preferred activity was symbolic play, more typically developing children indicated preference for symbolic play than children with ADHD (see Table 4).

In games with rules or construction, 62.5% of participants from G1 cited games (dominoes and memory) followed by construction games as their preferred play activities (31.3%). However, no one from this group reported board games or construction as the most preferred play activity (see Table 4) and no-one reported making sand castles. In contrast, 87.5% of G2 participants preferred board games (dominoes and memory). Of these participants, 37.5% reported board games were their most preferred play, 37.5% reported construction games their most preferred play and 37.5% reported making sand castles was their most preferred play activity. There was a significant difference between groups in relation to play with games (dominoes and memory) (*P* = 0.01) and making sand castles (*P* = 0.02). There was no significant difference between the groups in relation to construction.

Discussion

The predominance of male participants in the sample reflects the incidence of ADHD reported world-wide

⁸Ball *P* = 0.226; run and catch *P* = 1.000; who's got the ring *P* = 0.479 and hide and seek *P* = 0.356.

(Kaplan *et al.*, 2003). However, in this present study the ratio was 7:1 constituting an over representation of males. The over representation of males is due to the sample being children with ADHD combined (hyperactivity and attention deficit) as Poeta and Rosa-Neto (2004) and Vasconcelos *et al.* (2003) found that girls with ADHD were predominantly the inattentive subtype in Brazil.

Play partners

There were no significant differences between the groups for preference for play partners with classmates being the preferred play partner (combined most preferred and preferred). The fact that children with ADHD preferred to play with classmates is in contrast with others studies, as it has been reported that these children tend to show disruptive and aggressive behaviours, and as a result tend to be rejected as a play partner (Mikami, Huang-Pollock, Pfiffner, Mcburnett & Hangai, 2007). However, the present study examined play from the perspective of the child, and this fact needs to be considered when interpreting these results. These results could also be explained by the children with ADHD describing their play and skills with answers that were socially desirable (Harvey *et al.*, 2009) thus suggesting that children with ADHD tend to report on perceived socially desirable behaviour rather than their actual social participation, in this case about their participation in social play.

Mikami *et al.* (2007) and Cordier *et al.* (2009) found that although children with ADHD show interest and motivation to have friends, the deficits in abilities of social interaction are evident. Such findings corroborate with the study of Barkley, Fischer, Smallish and Fletcher (2002) who found that social abilities, such as, sharing, turn taking and co-operating, are not attractive to these children because they do not get immediate recompense and, thus, act in an egocentric way, resulting in the loss of friends. Children with ADHD have a propensity to speak with much detail about their play with play partners; however, when observing the play of these children, it has been noted that they frequently play alone (Harvey *et al.*, 2009).

Siblings were the most preferred partners for both groups. This could be due to the fact that the family is the first social cell and, therefore, this interaction is easily accessible. The relationship between siblings includes elements of direct reciprocity, in which siblings actively shape the life of each other contributing to the ability to play with other partners (Lobato, 1990).

The present study did not analyse the direct interaction between children and their play partners. Mikami and Pfiffner (2008) found that children with ADHD showed increased conflict in sibling relationships, relative to typically developing children, and they argued that this behaviour was from comorbid internalising problems that were associated with less warmth/closeness in the sibling relationship. Conversely, siblings can take on the role of protection with the child with the developmental issue and deal effectively with the difficult behaviour of

his/her sibling in constructing relationships, because they are familiar with their sibling's symptoms and distressing behaviours through daily contact. This knowledge equips them with the required skills to maintain harmony in play relationships. There is also research to show that the siblings of children with developmental issues frequently exhibit feelings of fear, anger, or guilt against the child with the developmental issue (Nunes & Aiello, 2008) and siblings themselves have more limited time and opportunities to play with their own friends (Baumann, Dyches & Braddick, 2005).

Places to play

There were significant differences between the groups in relation to preferred places to play. The children with ADHD most preferred the school to play in, which was followed by preference for playing inside the house. This suggests that these children prefer to play in places that are safe and protected with the presence and supervision of one or more adults. Poletto (2005) stated that the school is an important place because it offers a protected space to play, providing feelings of safety and entertainment, where friends are present, free play is allowed with their partners. The choice of the school is an appropriate space for children with ADHD to choose, because Cordier *et al.* (2009) found that physically and emotionally safe environments provide more opportunities for the development of play activities for children with ADHD.

Unsupervised and non-directed play is more likely to occur in the neighbourhood and street. Typically developing children most preferred play on the street, suggesting that these children are able to cope with more freedom and independence in play as they chose places that were unstructured and open and less protected than those preferred by children with ADHD. Children with ADHD are more likely to avoid playing in unstructured and open places because there is an increased likelihood for peer rejection (Bagwell, Molina, Pelham & Hoza, 2001).

Typically developing Australian children have been found to prefer active free-play in unstructured places such as their yard, street or public open space such as parks and playgrounds (Veitch *et al.*, 2006). Playing games in the street, park and playground is important for the development of children, as these spaces are where children play traditional games. Traditional games reflect the shared macro culture and rules of play are transmitted by older and more expert children to the younger children in multi-aged groups (Carvalho & Pedrosa, 2002). Playing in multi-age groups is common in Australian indigenous culture (Creaser & Dau, 1995).

Children with ADHD preferred playing at a neighbour's house more than typically developing children. A neighbour's house is a protected space near the child's own house and this permits safe socialisation in a larger sphere. Guimarães (2000) stated that the neighbour is part of the social support network for families with low income.

Toy and play activity preferences

Children with ADHD preferred toys and play activities that did not need partners or games with rules. They preferred educational activities and electronic games. These findings are supported in a study by Harvey *et al.* (2009) who found that children with ADHD reported preference for individual play. This was in contrast with typically developing children who preferred group activities, which involved friends and/or families. This could be related to the finding that more typically developing children indicated a preference for symbolic play than children with ADHD. This finding is consistent with Cordier, Bundy, Hocking & Einfeld (2010) and could, in part, be explained in that children with ADHD find pretend play difficult due to their difficulty in taking on other children's perspective and thus are less inclined to engage in pretend/symbolic play.

Children with ADHD are reported to engage less in spontaneous play and in organised motor activities (Harvey *et al.*, 2009), as they frequently present with difficulties in motor performance, including ball manipulation (Harvey & Reid, 2005). This may explain why motor activities for children with typically developing children were preferred in comparison to children with ADHD.

Children with ADHD did not list board games or construction as their most preferred play activity. These toys and activities have a predetermined set of rules in how to play with them as well as requiring the child to co-operate with others and being aware of the concepts implicit in the rules of the game (Bekker, Sturm, Wesselink, Groenendaal & Eggen, 2008). As children with ADHD are poor at identifying the emotional state of their play partners and poor at reciprocal sharing (Cordier *et al.*, 2009), this may explain why these children with inattention and hyperactivity do not prefer this type of play activity.

There was no significant difference between the groups in preference for electronic games and there was a high incidence for preference for this play activity. Play with electronic games has a high incidence in recent years with Brazilian children regardless of gender (Pfeifer, 2006). Electronic games are examples of contemporary toys in the play universe of children. These toys do not need the presence of another person (Meira, 2003) as the child stays in front of one screen without being physically and socially connected, being absorbed in a virtual world and distanced from the real world for many hours (Hinske, Langheinrich & Lampe, 2008). Australian children also play with electronic games and Downes (2002) reported that they use the computer like a tool and also a toy that provides opportunities for the blending of practice and performance.

Conclusion

This present study builds on studies such as that of Cordier *et al.* (2009). The present study found that chil-

dren with ADHD, in comparison to typically developing children, preferred fewer play partners and they chose play partners that were more conciliatory. The places they preferred to play were more protected and where there was more likely to be an adult supervising. They also preferred more individual play activities and activities where there were no implicit rules. These results add to our knowledge about the play of children with ADHD and contribute to the planning of intervention strategies in occupational therapy for this population.

Limitations and future research

This is preliminary research, and as such has highlighted areas for future research in terms of preferred places to play and play activities for children with ADHD. The sample size was small; however, the two groups were matched as closely as possible. The Children's Play Behaviour questionnaire (Pfeifer, 2006) has proven discriminative validity and inter-rater reliability. Further studies examining the test-retest and internal consistency reliability are currently being investigated. Using this instrument, this study found that there were significant differences between the preferred places and preferred activities of children with ADHD compared to typically developing peers with hypothesis two being supported and hypothesis three being partially supported. In future this study could be replicated to include a survey for teachers and parents on the play preferences of children with ADHD as well as typically developing peers. Such a study would allow further investigation in the play of children with ADHD.

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